

HiPerFET™ Power MOSFETs Q-Class

N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low Q_g
Low intrinsic R_g, low t_{rr}

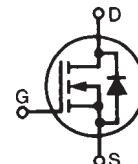
Preliminary Data Sheet

IXFK 24N120Q2

IXFX 24N120Q2

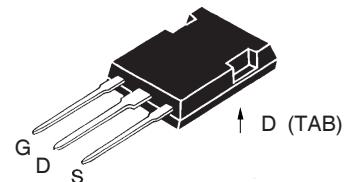
V_{DSS} = 1200 V
I_{D25} = 24 A
R_{DS(on)} = 0.65 Ω

t_{rr} ≤ 300 ns

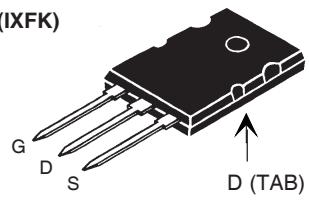


Symbol	Test Conditions	Maximum Ratings		
V _{DSS}	T _j = 25°C to 150°C	1200	V	
V _{DGR}	T _j = 25°C to 150°C; R _{GS} = 1 MΩ	1200	V	
V _{GS}	Continuous	±30	V	
V _{GSM}	Transient	±40	V	
I _{D25}	T _c = 25°C	24	A	
I _{DM}	T _c = 25°C, pulse width limited by T _{JM}	96	A	
I _{AR}	T _c = 25°C	12	A	
E _{AR}	T _c = 25°C	30	mJ	
E _{AS}	T _c = 25°C	4.0	J	
dv/dt	I _s ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _j ≤ 150°C, R _G = 2 Ω	20	V/ns	
P _D	T _c = 25°C	830	W	
T _j		-55 ... +150	°C	
T _{JM}		150	°C	
T _{stg}		-55 ... +150	°C	
T _L	1.6 mm (0.063 in) from case for 10 s	300	°C	
M _d	Mounting torque	TO-264	0.9/6 Nm/lb.in.	
Weight		PLUS-247 TO-264	6 10	g g

PLUS 247™ (IXFX)



TO-264 AA (IXFK)



G = Gate
S = Source

D = Drain
TAB = Drain

Symbol	Test Conditions	Characteristic Values			
		(T _j = 25°C, unless otherwise specified)	min.	typ.	max.
V _{DSS}	V _{GS} = 0 V, I _D = 3 mA	1200			V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 8 mA	2.5		5.0	V
I _{GSS}	V _{GS} = ±30 V _{DC} , V _{DS} = 0			±200	nA
I _{DSS}	V _{DS} = V _{DSS} V _{GS} = 0 V	T _j = 25°C T _j = 125°C		50 2	μA mA
R _{DS(on)}	V _{GS} = 10 V, I _D = 0.5 • I _{D25} Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			0.65	Ω

Features

- Double metal process for low gate resistance
- International standard packages
- Epoxy meet UL 94 V-0, flammability classification
- Avalanche energy and current rated
- Fast intrinsic Rectifier

Advantages

- Easy to mount
- Space savings
- High power density

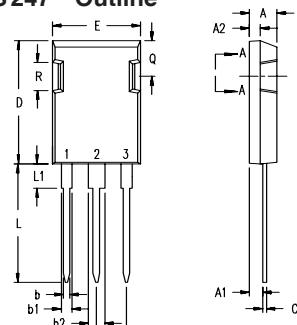
Symbol	Test Conditions	Characteristic Values		
		min.	typ.	max.
g_{fs}	$V_{DS} = 20 \text{ V}$; $I_D = 0.5 \cdot I_{D25}$, pulse test	15	25	S
C_{iss} C_{oss} C_{rss}	$V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	8200		pF
		560		pF
		110		pF
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 10 \text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 1.0 \Omega$ (External),	22		ns
		13		ns
		60		ns
		12		ns
$Q_{g(on)}$ Q_{gs} Q_{gd}	$V_{GS} = 10 \text{ V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$	180		nC
		45		nC
		80		nC
R_{thJC}	TO-264		0.15	K/W
R_{thCK}			0.15	K/W

Source-Drain Diode
Characteristic Values
 $(T_J = 25^\circ\text{C}$, unless otherwise specified)

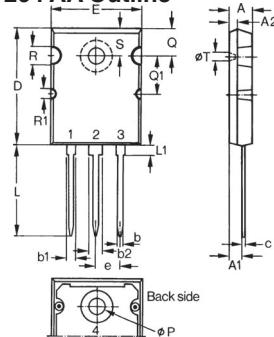
Symbol	Test Conditions	min.	typ.	max.
I_s	$V_{GS} = 0 \text{ V}$		24	A
I_{SM}	Repetitive; pulse width limited by T_{JM}		96	A
V_{SD}	$I_F = I_s$, $V_{GS} = 0 \text{ V}$, Pulse test, $t \leq 300 \mu\text{s}$, duty cycle $d \leq 2 \%$		1.5	V
t_{rr} Q_{RM} I_{RM}	$I_F = 25 \text{ A}$, $-di/dt = 100 \text{ A}/\mu\text{s}$, $V_R = 100 \text{ V}$	1 10	300 μC	ns A

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343 6,583,505 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1 6,683,344

PLUS 247™ Outline

Terminals:
1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L ₁	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

TO-264 AA Outline


Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.82	5.13	.190	.202
A ₁	2.54	2.89	.100	.114
A ₂	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b ₁	2.39	2.69	.094	.106
b ₂	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L ₁	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q ₁	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R ₁	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072